RESPONSE TO COMMENTS FROM U.S. ENVIRONMENTAL PROTECTION AGENCY ON THE DRAFT 1998 ANNUAL REPORT FOR SITE 9: NEPTUNE DRIVE DISPOSAL SITE NAVAL AIR STATION, BRUNSWICK, MAINE

COMMENTOR: Michael Barry **DATE RECEIVED: 17 May 1999**

The 1998 Annual Report much more clearly shows overall trends. Our comments and several supporting charts are in Attachment 1.

The report indicates to EPA that VOC inflow into the Site 9 area cannot be ruled out. However, discharge from the Site 9 area is well characterized in the monitoring program and the selected remedy in the Draft Proposed Remedial Action Plan remains appropriate. It's also clear that the VOCs are degrading at Site 9, but that this process will take several years.

GENERAL COMMENTS

1. ***Overall***

   a. This year's report is much improved. The new color charts and simple tables that commented on trends were a great improvement and significantly enhanced plume understanding. The charts of vinyl chloride/1,2-DCE ratios (Figure 3-8), total concentrations with a regression line (Figure 3-9), and overall trends of several wells (Figure 3-7) were especially useful and the data presentation much more conductive to analysis.

      Response—The Navy appreciates the EPA's positive response to the added figures and tables.

   b. Our review uncovered one omission error (Comment No. 14) and we disagree with one of the Navy's conclusions (Comment Nos. 3a. and 16c.).

      Response—Data reported in the Monitoring Event 12 report were in error. The correct data are presented in the 1998 Annual Report, which reports no detection of 1,1-DCA. Therefore, the Navy does not feel that additional sampling of this well would be necessary (see response to Comment No. 4a below).

2. ***Response to Comments***—We accept Navy responses to EPA comments on the 1997 Annual, Monitoring Events 11 and 12 Reports and look forward to the Final 1997 Annual Report.

   Response—The Final 1997 Annual Report is scheduled to be issued in September 1999.

3. ***Plume Evolvement***—Natural dechlorination of the parent VOCs in the Site 9 area (effectively all 1,2-DCE) is clearly taking place by the presence of vinyl chloride and rising vinyl chloride ratios in several wells. However, we cannot rule out the possibly of inflow of

parent VOCs which will later degrade to vinyl chloride. Some other factors to consider are:

a. 1,2-DCE was detected at 3 ppb in the new MW-NASB-227. This level itself isn't a concern, but it could cause a vinyl chloride exceedance of the MCL and MEG and is fresh inflow of contaminants. Future monitoring may show a trend. Because MW-NASB-227 is screened just above the clay, this should present the worst-case and MW-NASB-22 just to the north was non-detect.

Response—We agree with this assessment. Note the fourth bullet of Section 4.1.2 has been revised as follows:

> *Vinyl chloride was not detected in the sample from recently installed monitoring well MW-NASB-227. Therefore, based on current data, a source of vinyl chloride west of that portion of Site 9 does not appear likely. This is not a source in and of itself, however, since DCE has been detected and is anticipated to degrade, there could be vinyl chloride migrating from this area in the future.*

b. 1,1-DCA was detected at 0.3J ppb in MW-NASB-81 on Monitoring Event 12. This is the first detection of a VOC that will also decay to vinyl chloride at this well.

Response—As stated in response to Comment No. 1b, the detection of 1,1-DCA at 0.3J was not accurate.

c. Vinyl chloride/1,2-DCE ratio trends don't seem to spatially correlate but there are some similarities with screen depth. The two wells with steady ratios, MW-NASB-69/74, are bracketed by wells with increasing ratios. It's interesting to note that MW-NASB-69/74 are also the deepest wells along the axis of the plume with a history of VOC detections. Both are screened below 30-ft MSL, with the MW-69 screen down to 14.5 ft in sand and MW-NASB-74 to 25.6 ft, just above the clay layer. The other wells in the plume axis are shallower and have never had significant detections. Several other factors which could affect concentration at depth are dissolved oxygen content, VOC density, and the location of the historical source that wasn't located. The attached charts help display this.

Response—Geologic cross-sections will be utilized in the 1999 Annual Report to help assess the relationship of screen depth versus vinyl chloride detections in wells, and other factors including dissolved oxygen.

d. After never containing vinyl chloride, levels clearly started rising in MW-NASB-69 in late 1997, this followed 200 ft downgradient in MW-NASB-76, 200 ft downgradient, 6 months later in mid-1998 and could indicate a plume moving through the area. Yet the 3 upgradient wells, MW-NASB-79/80/81, were overall steady with low levels of vinyl chloride or non-detect during this period.

Response—Based on Figure 3-6, monitoring wells MW-NASB-079, MW-NASB-080, and MW-NASB-081 are not directly upgradient of MW-NASB-069 and, therefore, the plume movement noted in this comment is difficult to confirm.

e. MW-NASB-69, 80, and 81 are all upgradient of a long suspected historical source, the Building 201 septic system. This source wasn't found after several investigations but it was located immediately upgradient of MW-NASB-76 which has a history of vinyl chloride that had fallen, but are now rising again.

Response—Although no response is requested for this comment, we would like to note the Additional Source Investigation ruled out the septic system as a current source of vinyl chloride. Therefore, it is likely that rising concentrations of vinyl chloride in monitoring well MW-NASB-076 may be related to degradation of parent compound in ground water due to natural attenuation rather than from the septic system.

f. Future events may reveal longer term trends. To better understand the three-dimensional plume dynamics, a new hydrogeological cross-section that goes through most of the wells should be prepared and included in the 1999 Annual Report. The general location of the new cross-section, C-C', is proposed in the attached charts.

Response—A cross-section has been included as Figure 2-1 to clarify Section 2.2 (Geology).

g. As the report notes, these data, and especially the ratio information, can be thrown off by data quality issues because of the low concentrations involved. Depth and ratios should also be analyzed for any correlation.

Response—The relationship of vinyl chloride concentrations and screen interval will be discussed in future reports. The GIS visualization tool has recently been completed. This analysis will not be completed in the 1998 Annual Report, but will be assessed in the 1999 Annual Report.

4. ***Recommendations***—We concur with all the recommendations for future sampling and also propose:

a. Because of the detection of 1,1-DCA of 0.3J in MW-NASB-81, we think it should be included in the sampling events for several rounds to address our concerns about inflow of VOCs which will later decay to vinyl chloride even though their concentrations are well below the MCL/MEG.

Response—As stated in response to Comment No. 1b, 1,1-DCA was not detected during Monitoring Event 12. Therefore, no additional sampling of this well is planned.

b. Creation of a professional hydrogeological cross-section along the axis of the plume that included all wells with an offset should be prepared to aid trends analysis of the plume; please see EPA figures.

Response—Please see response to Comment No. 3f.

c. The Building 201 septic system is a likely past source of VOCs and its outline should be added to the figures, as are the ash landfill and incinerator.

Response—The outline of the Building 201 septic system has been added to site figures, although it is important to note investigations of this septic system did not indicate it is a current source of vinyl chloride, nor is the septic system a potential source for vinyl chloride detected upgradient.

d. General water quality parameters should also be correlated to the monitoring wells to assess natural attenuation effectiveness, especially in light of a suspect dissolved oxygen "shadow" because of BTEX at the upgradient NEX site.

Response—The assessment of natural attenuation is an important factor. In the 1999 Annual Report, these parameters will be more fully assessed, after additional gauging data from NEX and Site 9 wells have been collected. This will be completed in conjunction with the review of screen depth intervals and vinyl chloride concentrations, as noted in response to Comment No. 3c. However, it should be noted that this assessment will be limited because, as stated in the response to EPA Comment No. 16b, chlorinated VOC are not part of the analytical program for the NEX site.

5. ***Data Quality-Contaminated Blanks***—False TCE and PCE detections caused by either trip or method blank contaminations in the range of 1-2 ppb were encountered in 1998, as well as acetone and methylene chloride. These aren't an issue at Site 9 as the primary COCs are vinyl chloride and 1,2-DCE. However, these could significantly cloud the graphs due to the low concentrations and shouldn't be included, or at least footnoted on the graphs. This has been an ongoing situation at Site 9 and we believe that several of the charts at Appendix A and Figure 3-7 indicate higher than they should. Specific instances are in Comment Nos. 9, 13, and 15.

   Response—The false TCE and PCE results were an anomalous laboratory issue and are believed to be unique to Monitoring Event 13 results. As discussed at the 5 August 1999 Technical Meeting, this information is stated on the summary tables, and data qualified with a "B" qualifier (i.e., method blank contamination) is not included when calculating the total VOC values. Therefore, TCE and PCE were not used when calculating total VOC values.

6. ***Water Level Gauging***—We conclude that after responding to the retention ponds, the historical gradient across Site 9 from MW-NASB-81 to MW-NASB-72 has returned; a least mean squares regression line is nearly level across the whole period. Continued gauging with NEX site data and the new MW-NASB-227 will help refine the flow path.

   Response—We agree, and continued gauging with the NEX wells and new well (MW-NASB-227) will help refine the flow path.

7. ***Detection Limit for Vinyl Chloride***—The reporting limit is 2 ppb. Per previous letter, the Navy can use several methods to near the MEG of 0.15 ppb. See also comments to the draft LTMP.

Response—The detection limit for vinyl chloride was discussed at the 4 May 1999 Technical Meeting. This discussion concluded that analytical methods which can obtain the detection limit of 0.15 μg/L will be used only when monitoring wells are to be deleted from the Long-Term Monitoring Program and when detections of less than 2 μg/L are reported using EPA Method 8260B. Note that text has been added to the LTMP noting that this method will be used before monitoring wells will be considered for removal (see response to Comment No. 4 for EPA for Draft LTMP for Site 9).

SPECIFIC COMMENTS

8. ***Figure 1.2***—The Building 201 septic system should be added, it was just northeast of the northeast corner of the building.

   Response—The approximate outline of the Building 201 septic system has been added to Figure 1-2.

9. ***Figure 3-7***—This figure did a great job displaying long-term trends of wells with VOC detects. However, MW-NASB-74 and MW-NASB-75 seem to falsely indicate higher VOCs due to TCE in the blank for MW-74 and acetone, a likely laboratory artifact, in MW-75. The graphs shouldn't show lab artifacts as actual contamination. Recommend either excluding it or making it a footnote. This would make MW-NASB-75 look more decreasing and MW-NASB-74 less increasing, as is the actual case.

   a. Table 3-1 for MW-NASB-74/75. Same comment as above, neither of these issues seem to be noted in Table 3-1 for these wells.

      Response—As discussed at the 5 August 1999 Technical Meeting, it has been standard policy to not include data with a "B" qualifier (indicates method blank contamination) when calculating the total VOC values. This approach provides the most conservative estimate of VOC trends which may be occurring at Site 9. Therefore, the "J" qualified TCE values at MW-NASB-074 were included in the total VOC calculation. Acetone was included in the total VOC value for monitoring well MW-NASB-075 during Monitoring Event 13 due to the fact that it was not detected in the associated method blank (i.e., not "B" quantified).

      The following note has been added as the second to last sentence of the first paragraph of the Volatile Organic Compounds subsection of Section 3.2:

      > *Contaminants that were detected in the associated method blank have not been used when calculating the total VOC values.*

      Figure 3-4 has been revised to increase the vertical scale, and minimize the acetone result. Table 3-1 has not been changed.

10. ***Figure 3.8***—This figure is a great display for displaying trends.

    Response—The Navy appreciates EPA's positive response to the added figure.

11. ***Section 3.2***—Using a simple table to summarize the data on the charts was concise and complete.

    Response— The Navy appreciates EPA's positive response to the added table.

12. ***Section 3.2, Inorganics***—We assume since chromium doesn't appear on MW-80 that it was always non-detect (<4.0 ppb).

    Response—Chromium was non-detect during both sampling events in 1998 (Monitoring Events 11 and 12). Because chromium is a chemical of concern in ground water, it has been added to Table 3-1 for wells even though it was non-detect.

13. ***Section 3.3, Table 3-2 and Appendix A, Page 26 of 32; SW-10***—Same as in Comment No. 9, but for acetone. The one detection of 120 ppb on Event 12 is of no concern, yet throws off the vertical scale so that the Appendix A chart is useless.

    Response—Because the acetone value was not "B" qualified by the laboratory, it was included in the graph. Please see response to Comment No. 9. Note that acetone was detected in 3 monitoring events prior to Monitoring Event 12 ranging in concentrations from 1JB μg/L to 10 μg/L. Acetone was not detected in the sample collected during Monitoring Event 13. Therefore, the acetone concentration of 120 μg/L reported during Monitoring Event 12 is currently assumed to be anomalous. Surface water sample SW-010 will continue to be monitored and if acetone is detected in subsequent monitoring events, it will be addressed at that time.

14. ***Table 3.1, MW-NASB-81***—1,1-DCA was detected on Monitoring Event 12 at 0.3J, yet it doesn't appear on the table; it is accounted for on the graph at Appendix A (Page 24 of 32).

    Response—1,1-DCA was reported during Monitoring Event 12 in error. The data set reported in the 1998 Annual Report correctly summarizes the results for this well, and no detection of 1,1-DCA was noted.

15. ***Table 3-1, MW-NASB-227, and Appendix A, Page 25 of 32, MW-NASB-227***—Same as Comment No. 9. The Monitoring Event 13 data quality review indicated that the PCE in MW-NASB-227 was due to blank contamination and should be removed from the chart and footnoted on the table.

    Response—The following note will be added to the ground-water subsection of the Standard Notes Table:

    Contaminants that were detected in the associated method blank have not been used when calculating the total volatile organic compound values.

16. ***Section 4.1.2, Ground-Water Sampling Program, VOCs***

a. ***Second Bullet, Second Dash***—It appears that VOC may be flowing into the site. Rising 1,2-DCE will eventually cause rising vinyl chloride. Since the MCL for 1,2-DCE is 70 ppb, levels that wouldn't be a concern could be far above the MCL (2 ppb) or MEG (0.15 ppb) as they decay.

Response—The concentrations of parent compounds entering the site are likely to decay into vinyl chloride, although the time scale for these reactions and likely concentrations of daughter products are difficult to predict, as noted in this comment.

b. ***Third bullet***—As stated above, significant VOC levels aren't required at the NEX station to cause a vinyl chloride problem at Site 9. At what level, or to what detection limit if non-detect, have 1,2-DCE, 1,1-DCA, and vinyl chloride been detected at the NEX site?

Response—Monitoring wells at the NEX have been analyzed for BTEX and MTBE, TPH DRO, and TPH GRO. These wells are not currently analyzed for chlorinated VOC, as the concentrations of fuel-related VOC are the primary focus of the NEX remediation system.

c. ***Fourth Bullet***—We do not concur with the conclusion; 3 ppb of 1,2-DCE will eventually decay to vinyl chloride.

Response—The fourth bullet of Section 4.1.2 has been revised as indicated in response to EPA Comment No. 3a.

d. ***Fifth Bullet***—We concur that sporadic results could be expected. However, because it's a natural process with a long half-life, we'd expect natural attenuation to occur at a constant, or slowly changing rate. Due to the low concentrations, extreme care must be exercised in sampling and analysis because of the large effect they have on results. A small change in concentration results could make the ratio graph look very different.

Response—We agree with this comment. Note that the fifth bullet of Section 4.1.2 has been revised as follows:

> *The observed spikes in VOC and vinyl chloride concentrations followed by decreasing concentrations have been noted in site wells. These results are sensitive to a number of factors, including the low concentrations of vinyl chloride, the variability that may be present because of laboratory methods, and the significant scatter of the site data. Similar patterns are expected to continue.*

17. ***Section 4.1.2, Ground-Water Sampling Program, Inorganics***—The detection of chromium in MW-NASB-79 on Monitoring Event 11 seems suspect in light of non-detect/low levels on other events and in the upgradient well MW-80 (actually in the ash landfill footprint).

Response—This result is unusual in light of the other sampling results at this well. However, the concentration reported on the laboratory Form 1s is correct.

18. ***Section 4.1.3, Surface Water Sampling Program***—We note the discharge of vinyl chloride at a rate such that it's measurable in the stream at SW-10. This is probably due to ground-water discharge because the seep, LT-901, has been non-detect for vinyl chloride. Because of the relatively high MDL for vinyl chloride and the stable low levels that are usually detected at SW-10, the Method 8260B SIM could be used here for more accurate measurement.

    Response—The presence of vinyl chloride at SW-010 is not in dispute, as concentrations have been reported at this location in past sampling events. Therefore, further refinement of the method detection limit (from 2 μg/L to 01.5 μg/L) is not considered to be necessary.

19. ***Section 4.2, Recommendations***—See General Comment No. 4 and EPA comments to the draft revised LTMP in Attachment 2.

    Response—This comment refers to adding monitoring well MW-NASB-081 into the sampling program. As stated in response to Comment No. 1b, the detection of 1,1-DCA at 0.3J was not accurate. Therefore, no additional sampling of well MW-NASB-081 is planned.